

Ethnobotany of analgesic/ stimulant plants used by the inhabitants of Ajloun, Northern Jordan

Etnobotánica de las plantas analgésicas/ estimulantes usadas por los habitantes de Ajloun, norte de Jordania

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Abstract

All medicinal plants that showed the therapeutic effects as analgesic/stimulant by the inhabitants of Ajloun in the northern parts of Jordan during March 2011 to May 2013 were recorded and listed with full information. A total of 35 plant species belonging to 21 families are identified which are being used by the people of the study area. Data collected absolutely as the outcome of the methodology relied predominantly on qualitative tools such as informal meetings with the local people, open discussions and observation, which enabled the presentation of accurate account of knowledge routed via oral sources. The medicinal plants investigated are divided into seven main categories relative to their own mechanism of effect. The present study provides baseline data on analgesic/stimulant properties of native medicinal wild plants that can be more protected from over exploitation from one side, and further investigated by pharmaceutical industry for screening new active compounds from another side.

Keywords: Ethnobotany, analgesic, stimulant plants, inhabitants of Ajloun, Northern Jordan.

Resumen

Todas las plantas medicinales que mostraron efectos terapéuticos como analgésicos/estimulantes en los habitantes de Ajloun, en el norte de Jordania, entre marzo de 2011 y mayo de 2013 fueron registradas y listadas con información completa. Un total de 35 especies de plantas pertenecientes a 21 familias han sido identificadas, las cuales son utilizadas por la población del área de estudio. La información fue recogida en su totalidad como resultado de la metodología basada predominantemente en herramientas cualitativas, tales como reuniones informales con la población local, discusiones abiertas y observación, lo cual permitió la presentación de un recuento preciso de conocimientos provenientes de fuentes orales. Las plantas medicinales estudiadas se dividen en siete categorías principales según sus mecanismos de efecto. El presente estudio proporciona información que sirve de línea de base en lo referente a propiedades analgésicas/estimulantes de plantas medicinales nativas silvestres que deben recibir más protección de la explotación, por un lado, y mayores estudios por parte de la industria farmacéutica para determinar nuevos principios activos, por otro lado.

Palabras clave: Etnobotánica, analgésicos, plantas estimulantes, habitantes de Ajloun, Norte de Jordania.

Introduction

Jordan territories are located in the center of the Middle East between longitudes 35° 40' and 39° E and between latitudes 29° 30' and 34° N with total area estimated in approximately 90 000 square kilometers, extending in the transition region the Middle East countries, Syria and Lebanon from north, Iraq and Saudi Arabia from east, Egypt and Saudi Arabia from the south and Palestine from the west. Jordan generally exhibited the climate of desert or semi-desert with an arid climate, with few large natural wetlands, (Al-Eisawi,1982;

2012; Al-Eisawi *et al.*, 1998; Friedman *et al.*, 1986; Al-Quran, 2009; Zohary, 1973; Zohary & Feinbrun-Dothan,1962-1988).

This topographical diversity of Jordan, which creates varied ecological conditions within a limited area contributes to this wealth of plant diversity especially at the level of plant genera and species, so Jordan is of great interest because it is the meeting place of the Mediterranean, Irano-turanian, Saharo-arabian regions and the Nubo-sudanian regions. Because Jordan is situated at the junction of these different phyto-geographical regions,

the Irano-turanian, Afro-subtropical and Mediterranean, it acts as a floral bridge between the continents of Asia, Africa and Europe, so the flora includes a mixture of these elements together: *Juniperus phoenicea*, *Cupressus sempervirens*, *Pinus halepensis*, *Quercus coccifera* and *Ziziphus spina-christi* (Friedman *et al.*, 1986; Heinrich, 2000; 2002; Karim & Al-Quran, 1988; Al-Eisawi, 1982; Al-Quran, 2005; 2007; Zohary, 1973).

Indigenous remedies now days occupying a good position since it is safe and inexpensive, which gives it popularity among both rural and urban areas. So the information about ethnic groups or indigenous traditional medicine has played a vital role in the discovery of active constituents from medicinal plants.

The study area is located within Ajloun mountains at an elevation between 1100 to 1300 m above the sea level. This area is dominated by Mediterranean habitat since it is influenced by the westerly fronts' currents associated with winter precipitation, so the cold snowy winter is the general climate. The mean annual precipitation is of 635 mm in winter while the spring months tend to be wetter with average precipitation about 200 mm. The mean summer temperature is 24 °C while 2–6 °C is the average winter temperature (Al-Genidi, 1992; Lemon *et al.*, 2003; Jones & Clarke, 1990).

The main aim of the present study was to document the indigenous therapeutic uses of the investigated medicinal plants used as analgesic/stimulant by the local people living in this area for which no literature is still available concentrating on this special issue.

Material and methods

The researcher methodology relied predominantly on qualitative tools such as

informal meetings with the local people, open discussions and observation, which enabled the presentation of accurate account of knowledge routed via oral sources (Al-Quran, 2009). The study area is located within Ajloun mountains which is dominated by Mediterranean habitat, so the vegetation cover is mainly dominated by Mediterranean phyto geographical element dominated by *Pinus*, *Arbutus*, *Quercus* and *Pistachia*.

All collected specimens of wild medicinal plants that classified and identified were constructed in form of table containing the relevant information. The survey was unique and conducted during the period from March 2011 to May 2013 from four sites of the study area depending on collection of voucher specimens, identifying and classifying of these edible plant specimens. The field work is including also in addition to the field observation, the photographing of the specimens in the field directly. The four study sites were conveniently selected based on vegetation cover and altitudes, transect walks were carried out with local people for collection of correct species with their original habitat. Collected data was also cross checked in different areas from local informants either by showing the plant specimen or telling local names to the informants. Specimens were identified with the help of available literature (Al-Quran, 2005; 2007; 2009).

Results

All results concerning the wild medicinal plant species are listed with full information mentioning scientific names; family; local names; parts used; method of administration (Table 1).

Discussion

Analgesic and stimulant effects of plants

are two broad and contradictory concepts, beyond them many therapeutic effects are categorized especially expectorant, antispasmodic, diaphoretic, antipyretic, aphrodisiac, CNS stimulant, narcotic, antidysenteric, neurotonic, relieving headache and meningitis, storative, sedative, anti tussive, cardio tonic, depressing nerve ends, anti rheumatic, anti epileptic, hypnotic and muscular relaxant. In the present analysis, 35 plant species belonging to 21 families have been documented for their analgesic/stimulant therapeutic uses. All of the investigated species were wild. The most commonly reported families were: Lamiaceae (=Labiatae), Rosaceae, Asteraceae (=Compositae), Fabaceae (=Leguminosae) and Apiaceae (=Umbelliferae). The plant parts used ranged from leaves (16), bulbs (2), roots (3), whole plant (1), flowers (2), aerial parts (3), fruits (7), and latex (2). The method of administration falls into four categories; paste, cream, juice (syrup), cooked as food, mixed with dairy products, pickled and decoction. The soaking in hot or warm water either for fresh or dried specimens.

Although this indigenous type of knowledge is well-known, but some plant species are still not known especially with regard to the analgesic/stimulant properties.

The therapeutic use of plant species reported with analgesic/stimulant properties is rarely reported specifically as in this report. So, screening for active chemical constituents from these investigated wild medicinal plants is considered the major step towards establishing a good knowledge base. Further more; testing their biological activities against infectious organisms is the ultimate need in order to establish scientific ground for searching new active

compounds. Present investigation provides baseline information to screen out biological activities of these valuable plants in order to develop new analgesic and stimulant medicines from plant origin.

The mechanism of plant effect as analgesic and stimulant is varied among the plants:

(1) some plants like *Eupatorium cannabinum* L., *Lactuca virosa* L., *Arbutus andrachne* L. and *Hyoscyamus aureus* L. have higher level of analgesic effect in form of hypnotic or even narcotic, so these plants must be taken carefully with very small dosages because absolutely the increasing of dosages will lead to more deteriorated situation among the patients taking this type of plant cure. (2) Some medicinal plants having diaphoretic effects associated with antipyretic symptoms like *Anchusa strigosa* Banks & Sol. and *Cyperus longus* L. (3) Some medicinal plants have high level of stimulation properties reaching the sexual capabilities known as aphrodisiac like *Smilax aspera* L. and *Echium italicum* L. (4) some medicinal plants investigated having antispasmodic properties as analgesic effect, these are including *Calotropis procera* W. T. Aiton, *Potentilla reptans* L., *Silybum marianum* (L.) Gaertn., *Echinops ritro* L., *Lablab purpureus* (L.) Sweet, *Hypericum triquetrifolium* Turra, *Ballota nigra* L., *Origanum vulgare* L., *Salvia fruticosa* Mill., *Prosopis farcta* (Banks & Sol.) J. F. Macbr., *Asphodelus fistulosus* L., *Papaver rhoeas* L., *Adonis aestivalis* L., *Ruta chalepensis* L., *Solanum americanum* Mill. and *Apium graveolens* L. (5) some medicinal plants have expectorant effect associated with sedative and relaxant of headache, meningitis, infants' teething and rheumatic pains like *Ammi visnaga* (L.) Lam., *Styrax officinalis* L., *Solanum americanum* Mill., *Anemone coronaria* L., *Origanum vulgare* L., *Iris petrana* Dinsm., *Lolium temulentum* L., *Capparis spinosa* L.

and *Adiantum capillus-veneris* L. (6) some medicinal plants have direct stimulation effect on central nervous system (CNS), anti epileptic and nerves as neuro tonic like *Anthemis cotula* L., *Echinops ritro* L. and *Ruta chalepensis* L. (7) some plants have anti dysenteric properties associated with anti tussive effect like *Thymus mongolicus* (Ronniger) Ronniger, *Potentilla reptans* L., *Prosopis farcta* (Banks & Sol.) J. F. Macbr. and *Papaver rhoeas* L.

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Plant no.	Plant species	Common name	Family	Part used	Analgesic /Stimulant use	Administration
1.	<i>Adiantum capillus-veneris</i> L.	Venus hair	Adiantaceae	Aerial parts	Expectorant	attention: some plant extracts must taken in very small dosages because of toxicity
12.	<i>Calotropis procera</i> W. T. Aiton	Common name	Apocynaceae	Leaves	Antispasmodic for gastric diseases	Soaked in boiled water and used as syrup one time daily.
5.	<i>Anchusa strigosa</i> Bank & Sol.	Bugloss	Boraginaceae	Roots	Diaphoretic, antipyretic	Cooked with food when needed
17.	<i>Echium italicum</i> L.	Blue weed	Boraginaceae	Roots	aphrodisiac	Soaked in hot water, cool and oral taken in the morning.
13.	<i>Capparis spinosa</i> L.	Caper bush	Capparaceae	Fruits	Expectorant	Boiled in water, as syrup whenever needed
7.	<i>Anthemis cotula</i> L.	Anise	Asteraceae	flowers	CNS stimulant	Taken as pickle in the morning
18.	<i>Eupatorium cannabinum</i> L.	Water hemp	Asteraceae	leaves	Narcotic	Soaked in hot water, cool and oral taken one time a day.
22.	<i>Lactuca virosa</i> L.	Great lettuce	Asteraceae	Leaves and latex	Narcotic	Soaked in hot water, oral taken in the morning.
26.	<i>Potentilla reptans</i> L.	Five leaf grass	Rosaceae	Leaves	A n t i d y s e n t e r i c , antispasmodic	Soaked and taken as skin paste when needed
30.	<i>Silybum marianum</i> (L.) Gaertn.	Milk thistle	Asteraceae	Aerial parts	Antispasmodic	Soaked in hot water, oral taken one time a day
14.	<i>Cyperus longus</i> L.	Adrupe	Cyperaceae	Whole plant	Diaphoretic	Oral taken as salad when needed
						Soaked in hot water and oral taken

16.	<i>Echinops ritro</i> L.	Globe thishle	Asteraceae	Seeds	N e u r o t o n i c , antispasmodic	Boiled, cool and taken as syrup
9.	<i>Arbutus andrachne</i> L.	Pea nut	Ericaceae	Leaves and fruits	Narcotic	Boiled in water, as skin paste wherever needed.
15.	<i>Lablab purpureus</i> (L.) Sweet	Lablab bean	Fabaceae	Seeds	A p h r o d i s i a c , antispasmodic	Soaked in hot water, as skin paste when needed
23.	<i>Lolium temulentum</i> L.	Darnel, rey grass	Poaceae	Seeds	For headache and meningitis	Boiled in water, as syrup whenever needed
20.	<i>Hypericum triquetrifolium</i> Turra	St.John's wort	Hypericaceae	leaves	Antispasmodic	Soaked in hot water, oral taken in the morning in small dosages
21.	<i>Iris petrana</i> Dinsm.	Iris, orris	Iridaceae	Bulbs	Expectorant for teething infants.	Soaked in hot water, oral taken in the morning in small dosages
11.	<i>Ballota nigra</i> L.	Black hemp-nettle	Lamiaceae	Leaves	Antispasmodic, restorative	Soaked in hot water, cool and oral taken one time daily.
24.	<i>Origanum vulgare</i> L.	Organy	Lamiaceae	Leaves	Expectorant and antispasmodic	Soaked in hot water, oral taken when needed
29.	<i>Salvia fruticosa</i> Mill.	Sage, Clary	Lamiaceae	Leaves	Sedative for wounds healing	Soaked in hot water, as skin cream when needed.
34.	<i>Thymus mongolicus</i> (Ronniger) Ronniger	Thyme	Lamiaceae	Aerial parts	Antispasmodic, anti tussive	Oral taken as fresh arfter soaked in warm water
4.	<i>Anagyris foetida</i> L.	Red pimpernes	Fabaceae	Leaves and fruits	Depress never ends	Boiled in water, taken as cream whenever needed in small dosages.
27.	<i>Prosopis farcta</i> (Banks & Sol.) J. F. Macbr.	Locust pods	Fabaceae	Fruits	Antidy senteric, antispasmodic	Boiled in water, as skin cream whenever needed
10.	<i>Asphodelus fistulosus</i> L.	Asphodel	Xanthorrhoeaceae	Leaves	antispasmodic	Soaked in hot water, as skin cream in small dosages.
31.	<i>Smilax aspera</i> L.	Smilax	Smilacaceae	Fruits	Aphrodisiac, tonic	Soaked in hot water, oral taken in the morning.
36.	<i>Drimia maritima</i> (L.) Stearn	Squil white	Asparagaceae	Bulbs	Cardiotonic	Soaked in hot water, skin cream in the morning in small dosages

25.	<i>Papaver rhoeas</i> L.	Poppy	Papaveraceae	Latex and seeds	Antidysenteric, antispasmodic	Soaked in hot water, taken as skin paste in the morning in small dosages
2.	<i>Adonis aestivalis</i> L.	Adonis	Ranunculaceae	Roots	Antispasmodic	Boiled in water, cool, as syrup on the morning in small dosage.
6.	<i>Anemone coronaria</i> L.	Bugloss	Ranunculaceae	leaves	Sedative, anti rheumatic	Dried, as paste and taken wherever needed in small dosages.
28.	<i>Ruta chalepensis</i> L.	Rue	Rutaceae	Leaves	Antispasmodic , antiepileptic	Mixed with dairy derivatives especially margarine
19.	<i>Hyoscyamus aureus</i> L.	Hanbane	Solanaceae	leaves	Narcotic, hypnotic	Dried and soaked, as skin paste in the morning in small dosages.
32.	<i>Solanum americanum</i> Mill.	Black night shade	Solanaceae	Fruits	Antispasmodic, anti rheumatic	Soaked in hot water, taken as skin cream in the morning in small dosages
33.	<i>Styrax officinalis</i> L.	Storax	Styracaceae	Leaves	Expectorant for diphtheria and leucorrhoea	Soaked in hot water, as skin cream in the morning.
3.	<i>Ammi visnaga</i> (L.) Lam.	Pick tooth	Apiaceae	Fruits and seeds	Muscular relaxant of uterus and arteries	Dried and soaked, as skin paste whenever needed in small dosages.
8.	<i>Apium graveolens</i> L.	Greater snapdragon	Apiaceae	Leaves and flowers	Antispasmodic	Dried and soaked, taken as skin paste one time a day.
35.	<i>Tribulus terrestris</i> L.	Burra, gookerou	Zygophyllaceae	Fruits	Aphrodisiac	Boiled in water, as skin paste whenever needed



